

Phase Control Thyristor

DS6051-1 April 2011 (LN28262)

FEATURES

- Double Side Cooling
- High Surge Capability

APPLICATIONS

- High Power Drives
- High Voltage Power Supplies
- Static Switches

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V_{DRM} and V_{RRM} V	Conditions
DCR4720A34	3400	$T_{vj} = -40^{\circ}\text{C}$ to 125°C , $I_{DRM} = I_{RRM} = 400\text{mA}$, $V_{DRM}, V_{RRM} t_p = 10\text{ms}$, $V_{DSM} \& V_{RSM} =$ $V_{DRM} \& V_{RRM} +100\text{V}$ respectively
DCR4720A32	3200	
DCR4720A30	3000	
DCR4720A28	2800	
DCR4720A26	2600	
DCR4720A24	2400	

Lower voltage grades available.

KEY PARAMETERS

V_{DRM}	3400 V
$I_{T(AV)}$	4720 A
I_{TSM}	69000 A
dV/dt^*	1000 V/ μs
dI/dt	250 A/ μs

* Higher dV/dt selections available

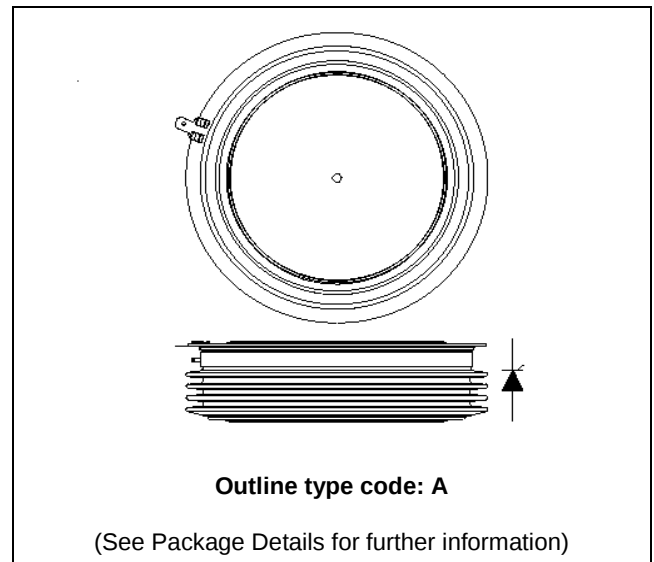


Fig. 1 Package outline

ORDERING INFORMATION

When ordering, select the required part number shown in the Voltage Ratings selection table.

For example:

DCR4720A34

Note: Please use the complete part number when ordering and quote this number in any future correspondence relating to your order.

CURRENT RATINGS

$T_{case} = 60^{\circ}\text{C}$ unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load	4720	A
$I_{T(RMS)}$	RMS value	-	7410	A
I_T	Continuous (direct) on-state current	-	6670	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 125^{\circ}\text{C}$	69.0	kA
I^2t	I^2t for fusing	$V_R = 0$	23.81	MA^2s

THERMAL AND MECHANICAL RATINGS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance – junction to case	Double side cooled	-	0.0057	$^{\circ}\text{C/W}$
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Double side cooled	-	0.0015	$^{\circ}\text{C/W}$
T_{vj}	Virtual junction temperature	Blocking V_{DRM} / V_{RRM}	-	125	$^{\circ}\text{C}$
T_{stg}	Storage temperature range		-40	140	$^{\circ}\text{C}$
F_m	Clamping force		80	100	kN

DYNAMIC CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Max.	Units
I _{RRM} /I _{DRM}	Peak reverse and off-state current	At V _{RRM} /V _{DRM} , T _{case} = 125°C		-	400	mA
dV/dt	Max. linear rate of rise of off-state voltage	To 67% V _{DRM} , T _j = 125°C, gate open		1000	-	V/μs
dI/dt	Rate of rise of on-state current	From 67% V _{DRM} to 4000A Gate source 30V, 10Ω, t _r < 0.5μs, T _j = 125°C	Repetitive 50Hz	-	250	A/μs
			Non-repetitive	-	1000	A/μs
V _T	On-state voltage	I _T = 3000A, T _{case} = 125°C			1.21	V
V _{T(TO)}	Threshold voltage	T _{case} = 125°C		-	0.86	V
r _T	On-state slope resistance	T _{case} = 125°C		-	0.115	mΩ
t _{gd}	Delay time	V _D = 67% V _{DRM} , gate source 30V, 10Ω t _r = 0.5μs, T _j = 25°C		-	3.0	μs
t _q	Turn-off time	T _j = 125°C, V _R = 100V, dI/dt = 1.5A/μs, dV _{DR} /dt = 20V/μs linear to 67% V _{DRM}		-	600	μs
Q _S	Stored charge	I _T = 2000A, t _p = 1000us,T _j = 125°C, dI/dt =1.5A/μs,		-	4000	μC
I _{RR}	Reverse recovery current			-	100	A
I _L	Latching current	T _j = 25°C,		-	1	A
I _H	Holding current	T _j = 25°C,		-	200	mA

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
V_{GT}	Gate trigger voltage	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	3	V
V_{GD}	Gate non-trigger voltage	At 40% V_{DRM} , $T_{case} = 125^{\circ}C$	TBD	V
I_{GT}	Gate trigger current	$V_{DRM} = 5V$, $T_{case} = 25^{\circ}C$	300	mA
I_{GD}	Gate non-trigger current	At 40% V_{DRM} , $T_{case} = 125^{\circ}C$	TBD	mA

CURVES

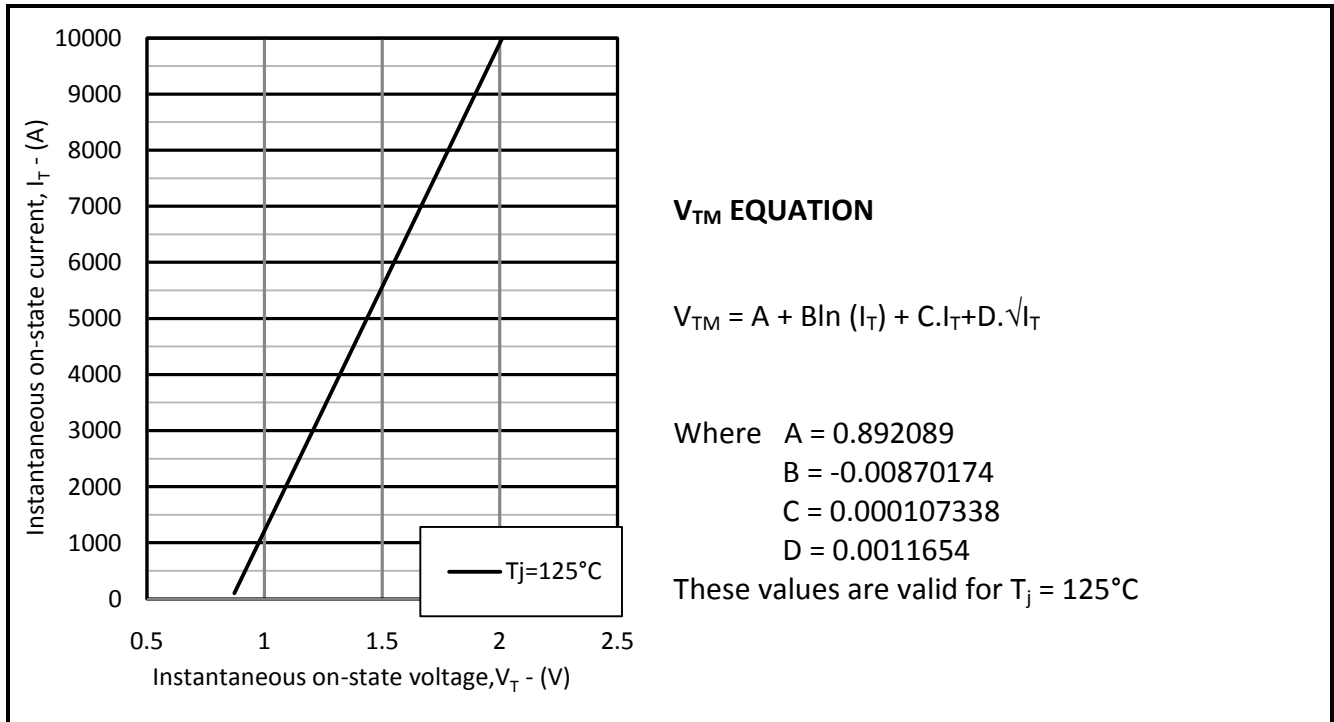


Fig.2 Maximum & minimum on-state characteristics

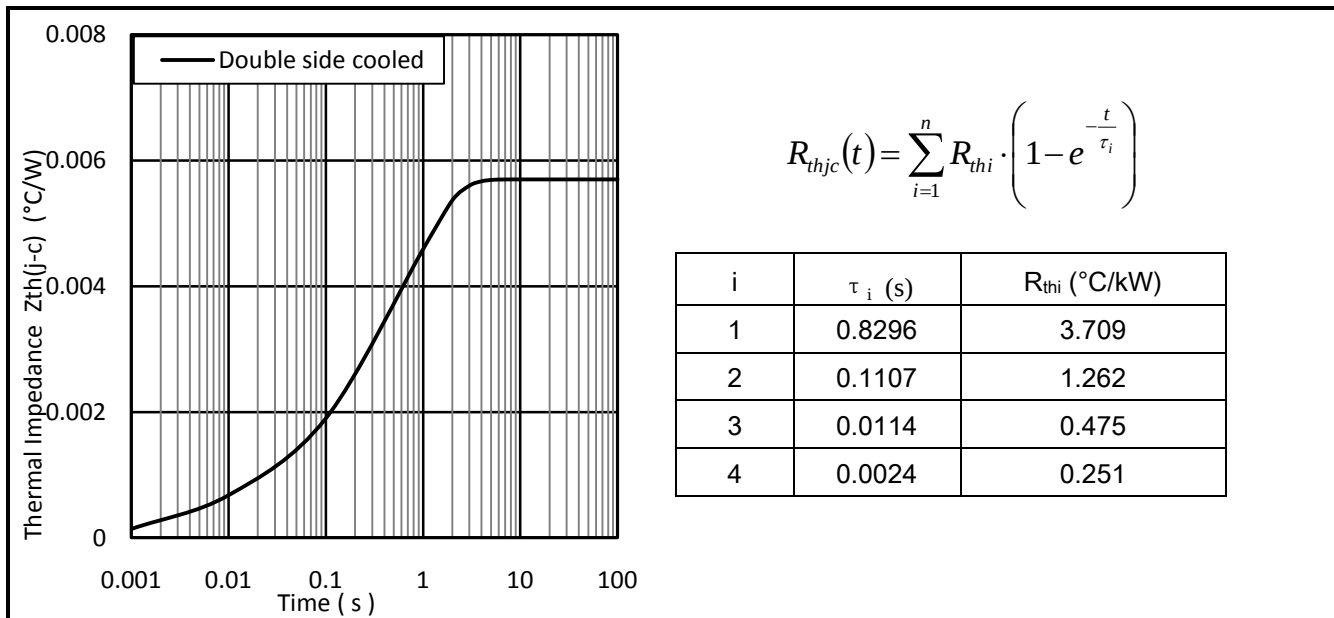


Fig.3 Maximum (limit) transient thermal impedance – junction to case (°C/W)

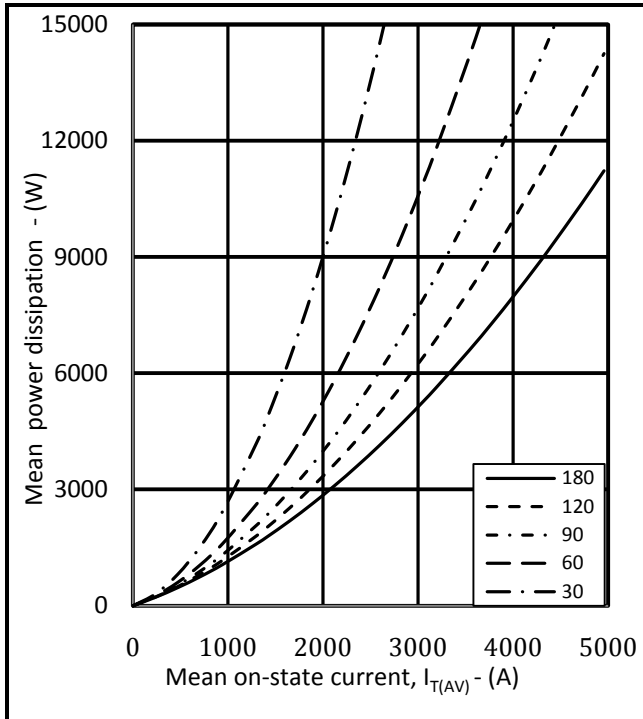


Fig.4 On-state power dissipation – sine wave

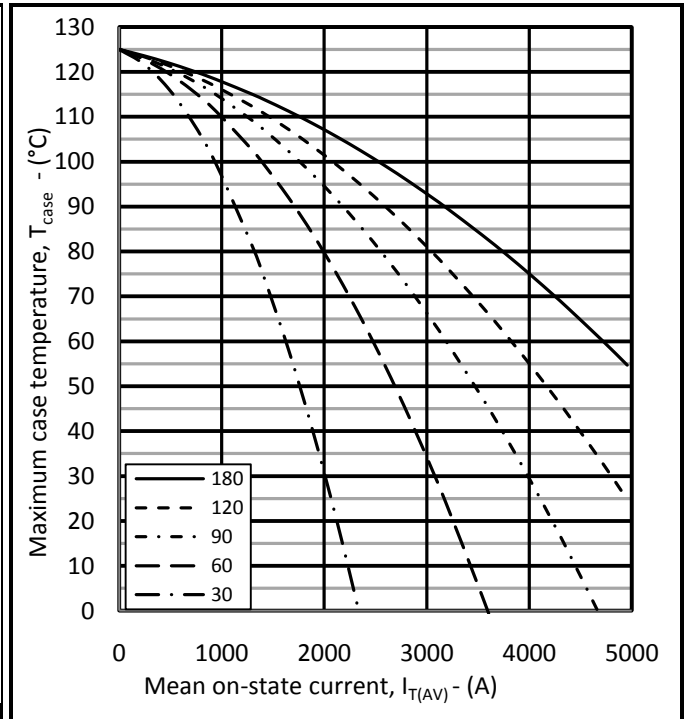


Fig.5 Maximum permissible case temperature, double side cooled – sine wave

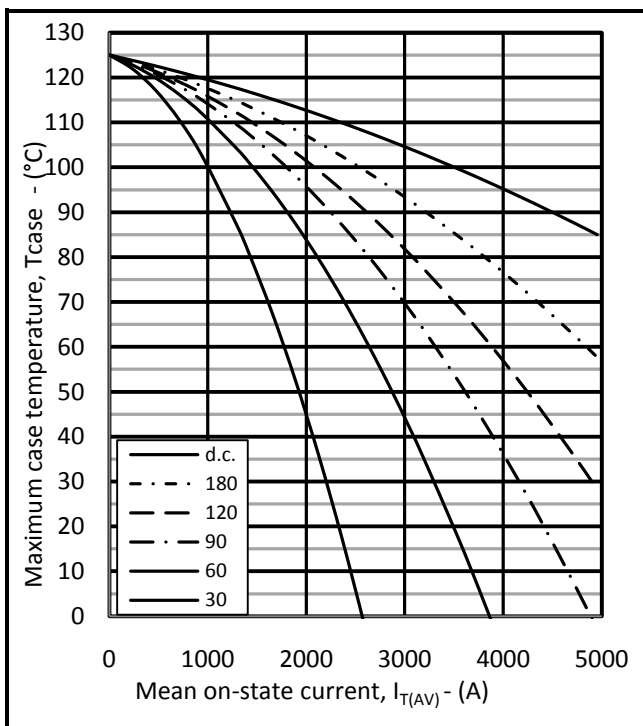


Fig.6 Maximum permissible case temperature, double side cooled – rectangular wave

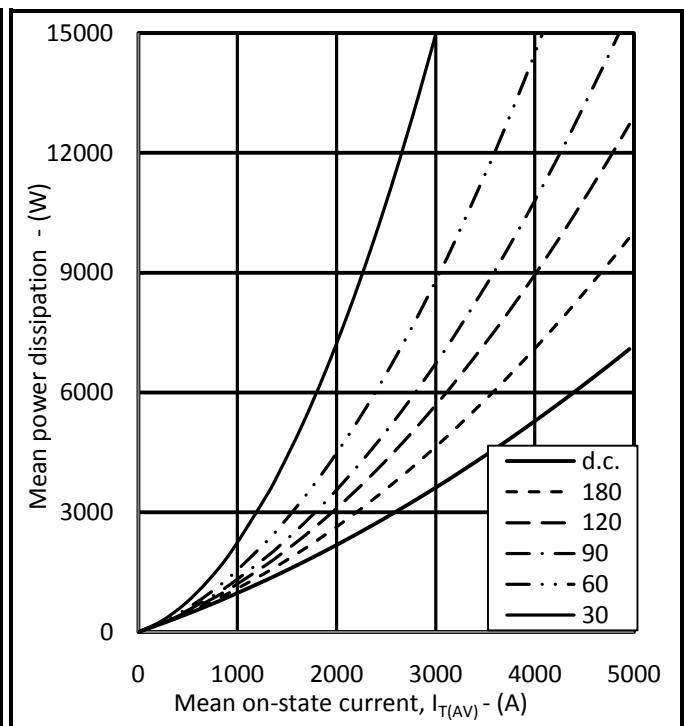


Fig.7 On-state power dissipation – rectangular wave

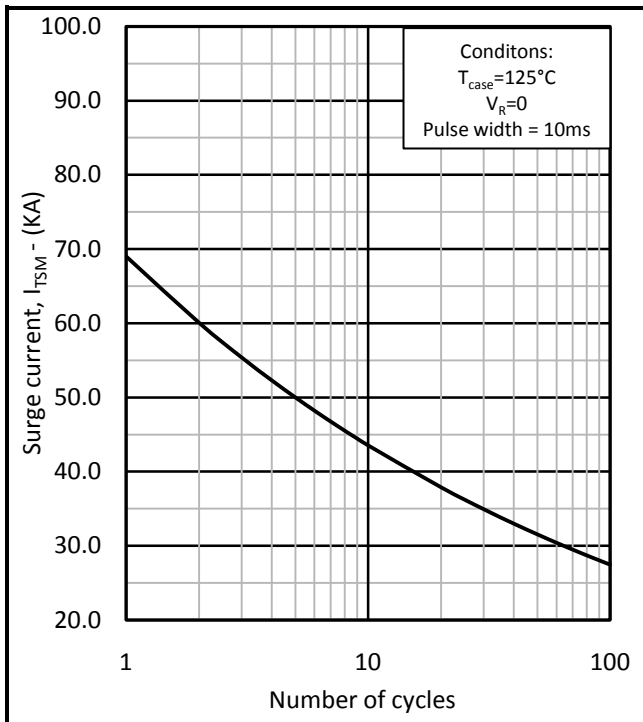


Fig.8 Multi-cycle surge current

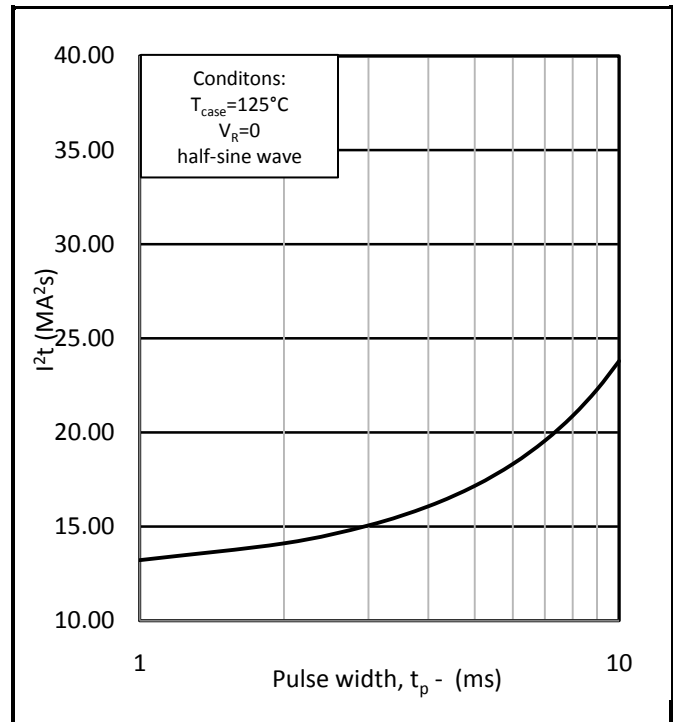


Fig.9 Single-cycle I^2t

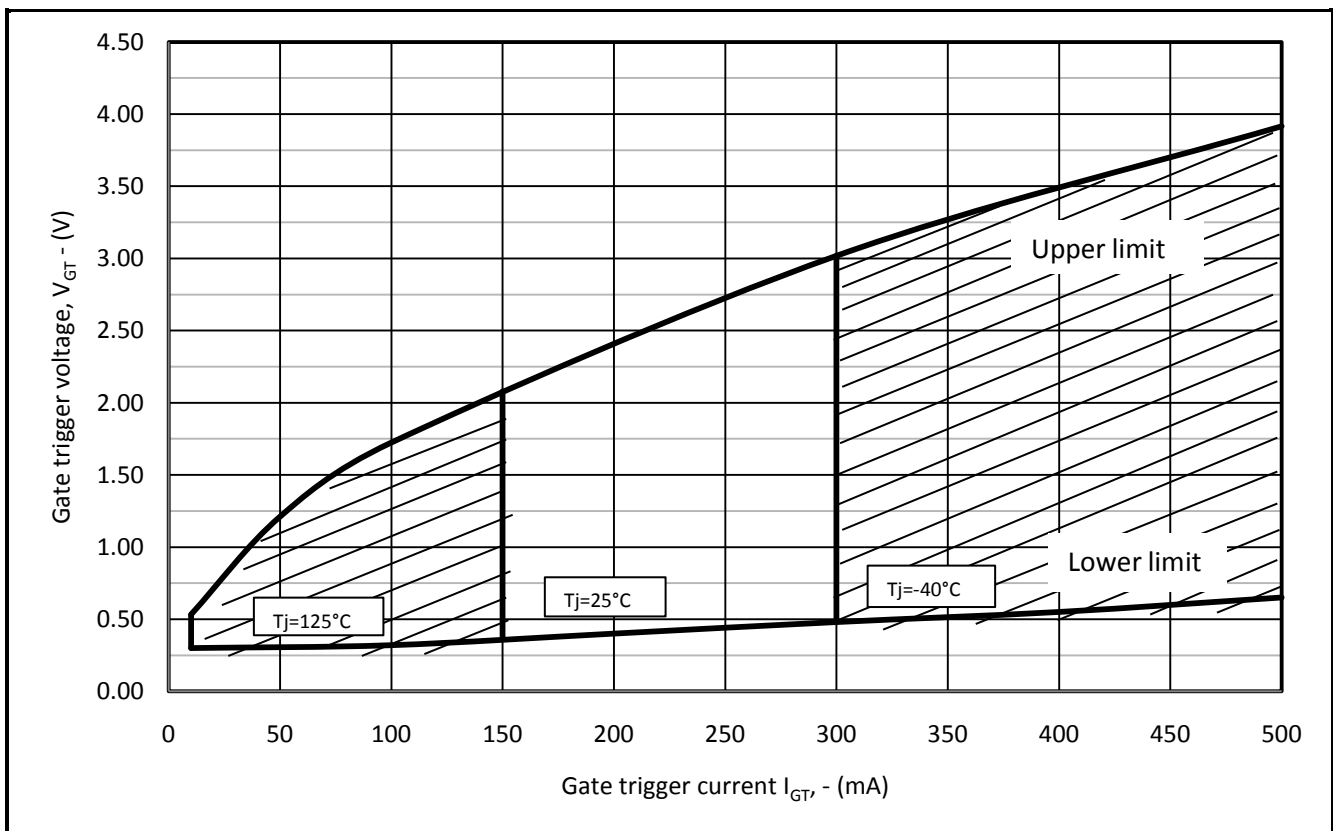


Fig.10 Gate characteristics

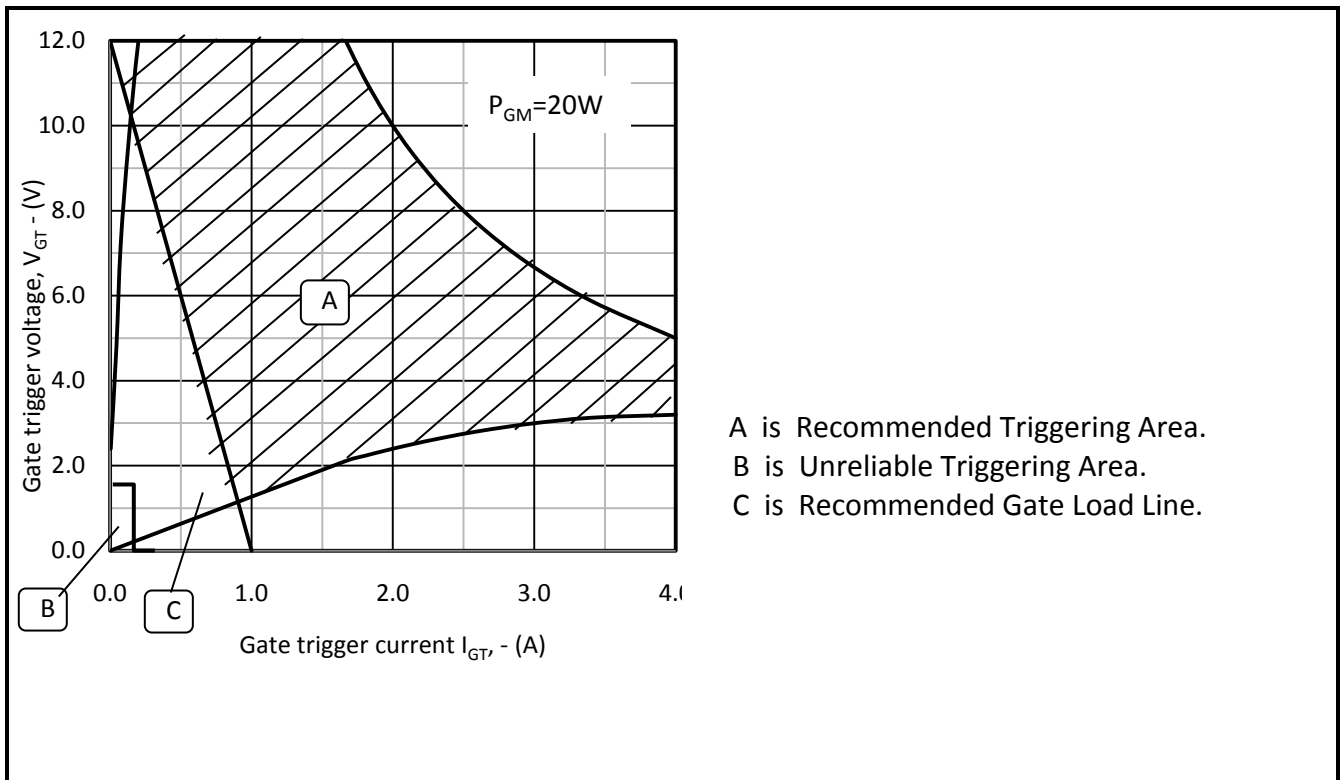
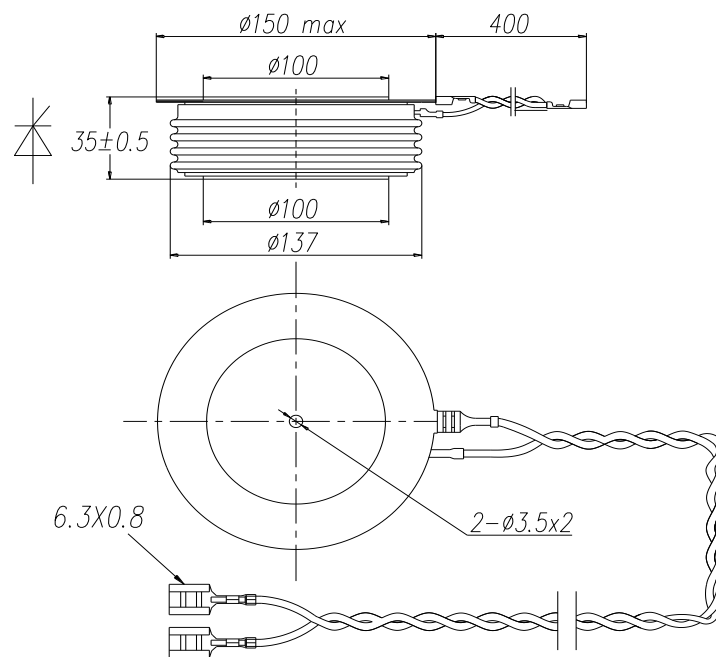


Fig.11 Gate characteristics

PACKAGE DETAILS

For further package information, please contact Customer Services. All dimensions in mm, unless stated otherwise.
DO NOT SCALE.



Package outline type code: A

Fig.12 Package outline

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